

WHAT IS CLAIMED IS :

1 1. A reel-deployable printed circuit board comprising:

2 an elongated, flexible base board having opposite edges and a slit formed into
3 it, the slit having an inner periphery defining a unit board within the flexible base
4 board; and,

5 a connection bar connecting the unit board to the base board such that the unit
6 board is pivotable on the connection bar relative to the base board.

Sub B' 2. The circuit board of Claim 1, further comprising:

2 a bonding pad on a top surface of the unit board;

3 a contact on a bottom surface of the unit board; and,

4 a via hole through the unit board electrically connecting the bonding pad to the
5 contact.

1 3. The circuit board of Claim 2, wherein the contact comprises a layer of copper plated
2 with gold.

1 4. The circuit board of Claim 1, further comprising a dam inside the inner periphery of
2 the slit.

1 5. The circuit board of Claim 1, wherein the base board is made of a glass-epoxy mate-
2 rial.

1 6. The circuit board of Claim 1, wherein the base board includes a sprocket hole along at
2 least one of the edges thereof.

09827112-0405004
T05040-2TT2860

1 7. The circuit board of Claim 1, wherein the base board includes a position hole along
2 one of the edges thereof.

1 8. The circuit board of Claim 2, further comprising:
2 a semiconductor chip attached to an upper surface of the unit board, the chip
3 having a connection pad on an upper surface thereof; and,
4 a conductive wire having opposite ends, each bonded to a respective one of the
5 bonding pad on the unit board and the connection pad on the chip.

1 9. The circuit board of Claim 8, further comprising an encapsulant formed on the top
2 surface of the unit board and encapsulating a region including the chip, the conductive wire,
3 the bonding pad, and the connection pad.

1 10. A method for manufacturing a semiconductor package using a reel-deployable printed
2 circuit board, comprising:

3 (A) forming a printed circuit board comprising an elongated, flexible base board hav-
4 ing opposite edges and a slit cut through it, the slit defining a unit board within the flexible
5 base board that is connected to the base board and pivotable relative to it by means of a con-
6 nection bar extending between the two boards in a direction perpendicular to the long direc-
7 tion of the base board, the unit board having top and bottom surfaces, a bonding pad on the
8 top surface, a contact on the bottom surface, and a via hole electrically connecting the contact
9 with the bonding pad;

10 (B) attaching a semiconductor chip to the top surface of the unit board;

11 (C) electrically connecting the semiconductor chip to the bonding pad; and,

12 (D) encapsulating the top surface of the unit board with an encapsulant in a region in-
13 cluding the semiconductor chip and the bonding pad.

09827142 040504
T05040 27142

- 1 11. The method of claim 10, wherein a plurality of semiconductor packages are simulta-
2 neously manufactured on the printed circuit board, and further comprising: separating the en-
3 capsulated unit boards from the flexible base board by cutting the connection bars.
- 1 12. The method of Claim 10, further comprising:
2 winding the printed circuit board onto a cylindrical reel to store the board and
3 to transport the board from one manufacturing station to another manufacturing sta-
4 tion; and,
5 unwinding the printed circuit board from the reel to perform a manufacturing
6 operation on the board.
- 1 13. The method of claim 10, further comprising forming a dam on the top surface of the
2 unit board to prevent runoff of a liquid encapsulant.
- 1 14. The method of claim 10, wherein the flexible base board is formed from a glass-epoxy
2 material.
- 1 15. The method of claim 10, further comprising forming a sprocket hole along at least one
2 of the edges of the flexible base board.
- 1 16. The method of claim 10, further comprising forming a position hole along an edge of
2 the flexible base board.
- 1 17. The method of claim 10, wherein encapsulating the unit board further comprises:
2 dispensing a liquid encapsulant into the region; and,
3 curing the liquid encapsulant.

09827132 040501

1 18. The method of claim 10, wherein encapsulating the unit board further comprises:
2 disposing a mold over the unit board;
3 transferring a molten encapsulant into the mold; and,
4 solidifying the encapsulant.

1 19. The method of claim 10, wherein electrically connecting the semiconductor chip to
2 the bonding pad further comprises bonding a wire having opposite ends to respective ones of
3 the bonding pad and the chip.

1 20. The method of claim 10, wherein electrically connecting the semiconductor chip to
2 the bonding pad further comprises:
3 forming a ball of conductive metal on the bonding pad or on a connection pad
4 formed on a surface of the chip;
5 orienting the chip with respect to the unit board such that the bonding pad and
6 the connecting pad are opposed to each other, with the conductive metal ball inter-
7 posed therebetween; and,
8 melting the ball such that it electrically connects the pads to each other.

Ad
C3